**REGENERATION ABILITIES OF SPONGILLID LARVAE.** *Memoirs of the Queensland Museum 44: 568. 1999:-* Free-swimming larvae of *Spongilla lacustris* were cut into two halves with a razor blade under a binocular microscope. Two samples of the larvae were used. In the first sample, larvae were cut in the tangential plane (two equal halves with a similar set of cells and structures). In the second sample, larvae were cut in the transverse plane (two unequal parts). The 'anterior' fragment contained a large cavity lined with pinacocytes, the halved amount of the surface flagellated cells, and underlying collencytes. The 'posterior' part of the larva had a halved amount of the surface flagellated cells and all of the internal structures typical for the fully developed spongillid larvae. Each half of the larva was maintained in a separate Petri dish with the celloidine-covered bottom in well-aerated river water.

Visual observations and transmission electron microscopy yielded the following preliminary results. The halves of the larvae closed the edges of the wound immediately after dissection while continuing to move. However, trajectory, velocity and direction of the movements differed in different types of experimentally cut larvae. This was directly related to the presence or absence and the development of the larval cavity. Thirty minutes following the dissection, the tangentially split halves of the larvae looked normal (movement, attachment and metamorphosis generally similar), but half the size of the control larvae. In 2-3 days after the settlement these half-larvae metamorphosed into normally functioning small sponges. Developmental capabilities of the transverse halved larvae were different. The anterior half-larvae soon closed the cut edges, acquired a shape of a hollow sphere and swam easily and rapidly in the water. They maintained activity for two or more days, attached, formed pinacoderm and few flagellated chambers, and the sponges died. The posterior halves recovered the integrity of the flagellar cover in an hour following the dissection. They acquired the shape of spheres tightly packed with cells, covered with slightly elongated flagellated cells, and swam heavily and slowly near the bottom, with a maximum free life of 18 hours. After the settlement and attachment they formed pupae covered with pinacoderm and within 2 days developed into normal sponges.

Transmission electron microscopy showed the surface flagellated cells played an important role. These cells provided restoration of the surface cell cover, however, their role greatly differed in development of the 'anterior' and 'posterior' half-larvae. In the 'anterior' halves, the flagellated cells migrated inside; some were ingested by underlying collencytes (phagocytosis); some transformed into choanocytes giving rise to few flagellated chambers. During development of the 'posterior' half- larvae, some surface flagellated cells transformed into the pinacocyte-like cells *in situ* and still retained flagella for a long time. The leading role in the transformation of the flagellated cells belonged to the centrioles (both flagellated and flagellum-less) and to the root structures of flagellum connected with the centrioles.

Collencytes played the important role in the attachment and development of the settled half-larvae. These cells actively migrated to the surface of the settled larva, phagocyted the cells damaged during dissection, secreted a large amount of collagen and contributed to the flattening of the half-larvae and their attachment to the substrate. The post- settlement fate of flagellated surface cells of the half-larvae was partially dependent on the amount and the activity of collencytes. The next major morphogenetic role belonged to archaeocytes, the main source for the formation of choanoblasts, spiculocytes, collencytes, pinacocytes and other cells. The archaeocytes mitotically divided several times, losing their storage inclusions, and thus gave rise to several differentiated cell lineages. Probably, the lack of the necessary amount of the cells is responsible for the developmental retardation of the settled 'anterior' half-larvae. ❐ *Porifera, Spongillidae, larva, metamorphosis, development, ontogeny, transmission electron microscopy.*

*V.V. Semenov, Biological Institute of St. Petersburg State University, Oranienbaumskoje shosse, 2, Stary Petergof, St. Peterburg, 198904, Russia; L.V. Ivanova (email: inna@sokolzoo.spb.su), Pedagogical State University named after A.I.Herzen, River Moika Emb., 48, St.Petersburg, 191186, Russia;* *1 June 1998.*